Water, Land and People in Climate Change







S. L. Tilakasiri

WATER, LAND AND PEOPLE IN CLIMATE CHANGE

Issues, Challenges and Perspectives

Editor

S L Tilakasiri



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CLIMATE CHANGE AND POVERTY:

A REVIEW

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Introduction

Climate Change that is often linked to global warming has continued to be an issue of global concern and discourse in the last two decades. Its severe consequences on human existence and on development have prompted international organisations like the United Nations to annually organise global conferences as a reminder. The 2015 Annual Conference on Climate Change organised by the United Nations was the 21st held between November, 30th and December, 12th 2015 in Paris, France (UN, 2015).

One key concern of the United Nations and the likes of it have been the causes of climate change that has ceased to reduce or stop. Apart from the natural causes linked to changes in earth's orbit, the amount of energy coming from the sun, ocean changes and volcanic eruptions, other causes are man-made through the burning of fossil fuels such as oil and coal (which emits greenhouse gases, e.g. carbon dioxide into the atmosphere). Human activities in agriculture, deforestation and mining also contribute to the proliferation of greenhouse gases (NASA, 2011). This situation is more severe in the Niger Delta region of Nigeria where the bulk of crude oil is explored, gas flaring and oil spillage have been a daily occurrence (Maier, 2000; Meredith, 2006; Campbell, 2010; Oyekale, 2012).

The most pronounced consequences of climate change include the rising sea levels due to the melting of the polar ice caps that contribute to greater storm damage leading to addition rainfall which in turn leads to flooding and other damages, increase in the incidence

of and severity of wildfires that threatens habitats, homes and lives and heat waves that contribute to incapacitation and at times to human death (Greenpeace, ud; Oxfam, ud).

Climate change indirectly also leads to the increase in poverty given the direct damage it has on agriculture, people's lives and properties, livelihoods and infrastructure. For instance, the China's Southeast-Yangshan region has over the years felt the effects of climate warming with the frequency and intensity of floods and droughts both markedly increasing and threatening agricultural production. In recent years the region has seen many extreme weather events including typhoons, floods, freezing rains and windstorms. For instance, torrential rains in mid-June, 2008 caused flooding that affected 42,339 people in 79 villages across the county. Some 4,598 houses were flooded and 116 collapsed. The floods resulted in RMB 20,150,000 in direct economic losses from crop failure, damage to roads, irrigation facilities and power stations. Due to climate change, poverty reduction in the region became increasingly challenging with the effectiveness of certain current measures being compromised. Climate change thus forced some households to return to poverty (Greenpeace, ud; Oxfam, ud).

Against this backdrop, it then becomes imperative for individuals, organisations and governments in both developed and developing countries to evolve policy measures that may mitigate against presently experienced and future consequences of climate change on the well-being of the people.

Drawing from the above thus, this chapter examines the concepts of climate change and poverty and provided an overview of the implication of climate change on the incidence of poverty in developing countries.

Conceptual Clarification: Climate, Climate Change and Poverty

Meaning of Climate, Climate Change and the Causes of Climate Change

The climate of a region or city is its average weather condition over a year. Weather on the other hand, is the short term changes in temperature, clouds, precipitation, humidity and wind in a region or city. Weather varies greatly from one day to the next or even within the same day. For example, in the morning the weather may be cloudy and cool, but by afternoon it may be sunny and warm (NASA, 2011).

Climate change on the other hand, is often referred to as the long-term increase in earth's climate or in the climate of a region or city. This includes warming, cooling and changes besides temperature. When linked to global warming it implies a long-term increase in earth's average temperature (NASA, 2011).

Some causes of climate change are natural. These include changes in earth's orbit and in the amount of energy coming from the sun. Ocean changes and volcanic eruptions are also natural causes of climate change. Other causes are due to the human use of fossil

fuels (e.g. oil and coal), which releases carbon dioxide and other greenhouse gases into the air. The gases trap heat within the atmosphere which can have a range of effects on the ecosystems including rising sea levels, severe weather events and drought that render landscape more susceptible to wildfires. Activities of human beings such as framing, deforestation and mining also contribute to the proliferation of greenhouse gases that cause climate change to occur (NASA, 2011; Odingo, 2012).

Consequences of Climate Change

As initially stated, climate change is caused by high temperature will lead to the melting of the polar ice caps which in turn will lead to rising sea levels that could contribute to greater storm damage leading to addition rainfall which in turn will lead to flooding and other damages (UNDP, 2007; NASA, 2011; Odingo, 2012).

Drawing from the projection of Intergovernmental Panel on Climate Change (IPCC) UNEP/SCCCL (2015) reiterates that climate change has the tendency to significantly reduce surface water and groundwater resources in most dry sub-tropical regions, thus intensifying competition for water among agriculture, ecosystems, settlements, industry, and energy production. Climate change has also the tendency to increase the frequency of droughts in presently dry areas given either or all of the following: (i) reduced rainfall, (ii) reduced snowpack (resulting in less snowmelt supplying rivers and streams); (iii) higher temperatures (which increase evaporation from surface water and soils); and (iv) sea level rise (which contributes to saltwater inundation of freshwater resources)(UNDP, 2007).

In addition, variations in the timing, magnitude, and type of precipitation, as well as temperature increases and sea level rise, can harm freshwater ecosystems by changing stream flow and water quality by undermining access to clean water, food, shelter, and other basic human needs thus interfering with livelihoods and displacing people from their homes. This can also lead to the degradation of water supplies for human consumption, agriculture, and other uses (UNDP, 2007; UNEP/SCCCL, 2015).

The impacts of climate change as stated above can also constitute a serious interference with the exercise of fundamental human rights, such as the rights to life, health, water, food, housing, and adequate standard of living. Even when mitigation, adaptation, and geo-engineering measures are put in place they can also adversely affect the exercise of human rights. For example, there are documented instances of hydroelectric and bio-fuel projects that have resulted in human rights violations. There is also a high risk of human rights violations resulting from the implementation of resettlement programmes for those who are displaced or at risk of displacement due to climate change, and a corresponding need to ensure that such programmes are undertaken with adequate input and consent from those who are relocated (UNEP/SCCCL, 2015).

Meaning of Poverty

From the conventional point of view, poverty is often linked to a situation where an individual is confronted with low income or low consumption-expenditure which is often used for the construction of poverty line (Laderchi *et al.,* 2003; Bradshaw, 2006; Nunes, 2008; Ijaiya, 2012).

A number of studies on poverty saw it beyond the lack of income and its skewed distribution, but relate it to hunger, lack of basic capabilities to live in dignity, lack of shelter, being sick and not being able to go to school, not knowing how to read, not being able to speak properly, not having a job, fear for the future, losing a child to illness brought about by unclean water, powerlessness, lack of representation and freedom (Sen 1985; World Bank 1990; World Bank 1999; Sen 1999; World Bank 2001; Sengupta 2003; Hunt *et al.,* 2004). In the light of the International Bill of Human Rights, poverty is seen as a human condition characterised by sustained or chronic deprivation of the resources, capabilities, choices, security and power necessary for the enjoyment of an adequate standard of living and other civil, cultural, economic, political and social rights (UN 2002; Adeyemi, Ijaiya and Ijaiya, 2007; Ijaiya, 2012).

Causes of Poverty

Aside the causes of poverty that were linked to its definition as stated above, McCaston and Rewald (2005) developed a causal hierarchy that is useful in understanding the underlying causes of poverty. This causal hierarchy is broken down into three categories: immediate causes; intermediate causes; and underlying causes as shown in Table 1.

Table 1: A Causal Hierarchy of Causes of Poverty.

Causes of Poverty	Some Examples
Immediate Causes	These are causes that are directly relate to life and survival and include: • Disease • Famine • Environmental disasters as a result of climate change • Conflict
Intermediate Causes	These causes affect people's well-being and opportunities for development and livelihood security, and include: • Low livelihood (agric or income) productivity; • Limited livelihood opportunities; • Lack of skills; inadequate access to food; • Inadequate care for women and children; • Lack of basic services, e.g., health, education, water and sanitation.
Underlying Causes	These causes are related to the structural underpinnings of underdevelopment, specifically social systems and political and economic structures, and environmental issues. They involve: • Economic: Inequitable resource distribution (distributive justice);globalization; terms of trade; structural adjustment • Political: Poor governance and institutional capacity; corruption; violent conflict; lack of political will; domination by regional/global superpowers • Social: Marginalization, inequality, social exclusion (based on gender, class, ethnicity); harmful societal norms, customs and cultural practices, over-population • Environmental: Carrying capacity; resource-based conflict; environmental disasters resulting from climate change; propensity for human disease; propensity for crop and livestock disease

Sources: McCaston and Rewald (2005); Ijaiya (2012).

Consequences of Poverty

As observed by Narayan *et al.* (2000a), most often, as poverty prevail in the society, most households crumbed under the weight of deprivation, as men, unable to adapt to their failure to earn adequate incomes under harsh economic circumstance, have difficulties accepting that women are becoming the main bread winners that necessitates a redistribution of income within the households. The result is often alcoholism and domestic violence in the part of men and a breakdown of the family structure. Women in contrast tend to swallow their pride and go out into the streets to do demeaning jobs, or in fact, do anything it takes to put food on the table of their children and husbands.

Narayan *et al.* (2000a) also observed that when people are in poverty, they are confronted with agonizing choices because they are powerless and voiceless. When people are poor they are also faced with options that are often exceptionally constrained. In making choices the best they can do may be to look for the least negative and damaging. Poor people also have little cushion against mistakes. They have to choose with care, for example, among different sources of cash or credit for daily needs or for an emergency. They are forced to trade-off one bad thing against another just like trading off a good candidate for a bad one during an election because of money.

In furtherance to the above, when people are poor, they tend to lack protection against violence, extortion and intimidation and also lack civility and predictability in interactions with public officials. The poor are also prevented from taking advantage of new economic opportunities and engaging in activities outside their immediate zone. Threats of physical force or arbitrary bureaucratic power make it difficult for them to engage in public affairs, to make their interests known and to have them taken into account (Narayan *et al.*, 2000b).

Von Hauff and Kruse (1994) also observed the consequences of poverty arising through the formation of slums in cities, and a worsening of ecological problems in the rural areas as a result of predatory exploitation in the agricultural sector and through the failure to use the available human and natural resources diligently without degrading the environment (Atoyebi and Ijaiya, 2005).

Trend of Poverty in Developing Countries

Given the causes and consequences of poverty as enumerated above and as indicated in Table 2, the poverty situation in developing countries has shown some reduction given that in 1990, close to half of the people in these regions lived on less than $1.25 a day. This rate for instance, South Asian, dropped to 30 per cent by 2010. However, this progress on poverty reduction was not even. While region, such as, Eastern Asia and South Eastern Asia, have met the target of halving the extreme poverty rate before the 2015 deadline as prescribed by the Millennium Development Goals (MDGs), other regions, such as, sub-Saharan Africa and Southern Asia did not (UNDP, 2014; Ijaiya, 2015; World Bank, 2015).

At the country level, one third of the world's 1.2 billion extreme poor lived in India alone. China, despite much progress in poverty reduction, ranked second, and was home to about 12 per cent of the global extreme poor. Nigeria (9%), Bangladesh (5%) and the Democratic Republic of the Congo (5%) followed in that order. Nearly two-thirds of the extreme poor lived in those five countries in 2010 (Ijaiya, 2015; UNDP, 2014; World Bank, 2015).

Table 2: Poverty Head Count Ratio at $1.25 per day (PPP) Percentage (%) of Population in Less Developed Countries in 2010.

Region	1990 (%)	2010 (%)
Sub-Saharan Africa	56	48
South Asia	51	30
South Asia (excluding India)	52	22
South Eastern Asia	14	45
Eastern Asia (China only)	60	12
Latin America and Caribbean	12	6
Caucasus and Central Asia	10	4
Western Asia	5	4
Northern Africa	5	1

Sources: UNDP (2014); Ijaiya (2015); World Bank (2015).

Climate Change and Poverty in Developing Countries

Emerging facts on the issue of climate change and poverty have shown that most developing countries and their people are the most vulnerable to the dangers of climate change in that their agriculture and way of life are more dependent on natural precipitation and their resilience to fluctuations in water resources and natural disasters are more fragile. The strength of their human and financial resources, technology and governance systems necessary for adapting to climate change are also relatively weak. So when there emerge any change in the climatic conditions of the countries this change set to exacerbate poverty both directly and indirectly (Greenpeace, ud.; Oxfam, ud.).

Directly, extreme weather conditions will cause damages to agriculture to the extent that agricultural productivity will decrease, diseases, pests and weeds will affect wider areas, pest-infestation periods will be longer thus causing serious damage to crops and livestock. With extreme weather conditions, distribution of water resources will also change in that with higher temperature, evaporation will increase and most regions will experience a shortage of agricultural water resources. From the perceptive of health, climate change has the tendency of endangering human health by increasing the outbreaks of disease and their transmission. For instance after floods, infectious diseases such as diarrhea, cholera, dysentery and typhoid are likely to be more prevalent (Greenpeace, ud; Oxfam, ud; Markandya and Chiabai, 2012; Fulai *et al.*, 2015).

Indirectly, at the household and community levels, due to climate change seasons will become unpredictable, farming will become riskier, freshwater supplies will become unreliable, storms and rising sea levels will threaten to take away communities living on islands and in coastal areas. Survival under such conditions will become ever more difficult. At the national level, there is the tendency for climate change to have a long-term effect on economic growth and social development (Greenpeace, ud; Oxfam, ud).

Climate change also has the tendency of threatening the objective of sustainably eradicating poverty. Poor people and poor countries are exposed and vulnerable to all types of climate-related shocks, e.g., natural disasters that destroy assets and livelihoods; waterborne diseases and pests that become more prevalent during heat waves, floods, or droughts; crop failure from reduced rainfall; and spikes in food prices that follow extreme weather events. Climate-related shocks also affect those who are not poor but remain vulnerable and can drag them into poverty, for example, when a flood destroys a microenterprise, a drought decimates a herd, or contaminated water makes a child sick. Such situations can erase decades of hard work and asset accumulation and leave people with irreversible health and welfare consequences (Hallegatte *et al.*, 2016).

A case of country with prevailing consequences of climate change on poverty is China. A country where the vast majority of the poor are located in ecologically-fragile zones. For instance, the fragility of some of the zones has led to glacial retreat; intensification of droughts; forest and vegetation atrophy; enhanced soil erosion; frequent extreme weather events and intensified disasters; sea-level rise and accelerated coastal erosion. In Yongjing region, for instance, due to local climate warming and decreasing precipitation, droughts in the region are becoming increasingly severe. The sustained drought of 2006 directly affected 83,100 people in the region, equivalent to 41.6 per cent of its total population. Reduced output due to crop failure resulted in 29,000 people needing emergency grain, 69,300 people had restricted access to drinking water and 34,000 were forced to leave their homes in order to find work or seek refuge with friends or family. Successive years of drought have forced people in certain mountainous areas of the region into long-term poverty. Normal productive life has been gravely affected and this has become the local community's principal cause of recurring poverty (Greenpeace, ud).

Greenpeace, (ud) also reiterates that the majority of poverty-stricken areas in the region are remote, located far from economic centres and without good transportation links. Furthermore, a lack of resources and infrastructure and a water shortage, combined with rapid population growth and low standards of basic social services such as health and education has hindered their ability to cope with disasters if they occur.

In Malawi, the winds that blow across the country before the prevailing climate change shape the lives and livelihoods of farmers and fisher folk. The people of the country know each wind by name, when it comes, how it behaves, its effects, and therefore, what they should do in response. But this has changed in that the winds that once brought rain to make the crops grow and fish to their nets no longer blow as and when they should. Instead there is a muddle of contradictory currents, both in the air and in the waters of Lake Malawi. Sometimes the winds are so strong, and rains so heavy, that they destroy houses, crops and boats. Furthermore, it is reported that the main rainy season is becoming ever-more unpredictable. In general, over the last 40 years temperatures are hotter and the rains are arriving later and becoming more intense and concentrated, which reduces the length of the growing season and triggers both more droughts and more floods. Climate change in Malawi also interacts with environmental degradation, notably deforestation, and it is

women who suffer most. Women have multiple roles as farmers and bringers of water and firewood and so depend very directly on natural resources (Oxfam, 2009).

In Uganda, between 2005 and 2011, farmers suffered from production shocks that reduced their income and consumption as a result of climate change. Available data suggest that a 10 percent reduction in water availability due to a lack of rainfall reduces crop income by an average of 14.5 per cent. Consumption also falls, but less so (Hallegatte *et al.*, 2016).

Matin (1998) cited in AfDB *et al.* (2003) reiterate that Bangladesh is also a prime example of a country that is particularly vulnerable to climate change. With a low-lying coastline, high population density, and an economy highly dependent on agriculture, the lives and livelihoods of people are threatened by frequent cyclones and the associated effects, such as saltwater intrusion, that render agricultural lands unproductive. Between 1974 and 1998, the country experienced seven major floods. In 1998, about 68 per cent of the country's geographical area was flooded, affecting more than 30 million people and causing 918 fatalities. Economic losses were estimated at US$3.3 billion, equivalent to 8 per cent of the country's GDP (Choudhury, 1998; Choudhury *et al.*, 1999 cited in AfDB *et al.*, 2003).

IPCC (2001b) cited in AfDB *et al.* (2003) also observed that the impact of climate variability on countries is also well illustrated by the environmental and socioeconomic damages associated with El Niño. El Niño is a natural recurring climatic phenomenon associated with fluctuations in the atmospheric pressure and sea surface temperatures in the tropical Pacific Ocean. It affects the climate on a global scale, with the impacts concentrated in the tropical and subtropical regions. The shift in sea surface temperature is known to affect marine productivity. On land, El Niño is associated with floods and droughts in Latin America, Asia, and Africa, as well as, changes in extreme events and the distribution of vector-borne diseases. El Niño has caused loss of life, destroyed livelihoods, and affected national economies. For Ecuador, the overall costs of direct damages to agriculture, livestock and fishing associated with the 1997-98 El Niño constituted 4.7 per cent of its agricultural Gross Domestic Product (GDP). Loss of harvest and rising unemployment of agricultural workers led to an increase in the incidence of poverty by 10 percentage points in the affected municipalities (Vos *et al.*, 1999 cited in AfDB *et al.*, 2003).

Concluding Remarks

This chapter examined the concepts of climate change and poverty, their causes and consequences. In furtherance, the paper also examined the impact of climate change on the incidence of poverty in developing countries drawing instances from countries like China, Malawi, Uganda, Ecuador, and Bangladesh among others. Critical to climate change is the extreme weather conditions that threaten the objective of sustainably eradicating poverty. For instance, poor people and poor countries are exposed to and vulnerable to all types of climate-related shocks, such as, natural disasters and crop failure from reduced rainfall.

Addressing the existing and future consequences of climate change on the livelihood of the people will require among others the following measures:

- the assistance and cooperation of international organisations and government at all levels in ensuring adequate information about the impacts of climate change. The information about climate change should go beyond the rhetoric of organising conferences, workshops and seminars on climate change as recently observed, but instead add to the existing methods of reaching out to the people using traditional/ indigenous methods of passing information, e.g. traditional institutions and rulers via the use of town carriers in villages and towns and the use of local radio networks;
- adoption of pragmatic mitigation methods that are peculiar to the environment and cultural believes of the people is essential;
- learning from experience and adapting to the consequences of climate change is also essential since countries, communities and households would be able to build resilience to all types of shocks that emanate from climate change;
- there is the need to address the existing and future implications of damages resulting from climate change by including the people (especially, the poor who are usually the most affected), in the design, implementation, monitoring and evaluation of policies pertaining to climate change. The essence of involving the people at all stages is to make them part owners of the policies. One advantage of this is the commitment of people to the success of the policies on climate change;
- allowing the people ownership of the resources is also significant to the protection and management of the environment for successful livelihood; and
- governance and institutional issues that emphasises on accountability, transparency and rule of law in the use and management of resources (human, material and financial) meant for addressing climate change are pertinent. Situation where corrupt government officials siphoned funds earmarked for addressing the challenges of climate change will spell doom to the people.

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